197107

STATE OF SOUTH CAROLINA)

(Caption of Case)
In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsv)

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET
NUMBER: 2008 - 196 - E

(Please type or print)

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DOCKETING INFORMATION (Check all that apply)

☐ Emergency Relief demanded in petition ☐ Request for item to be placed on Commission's Agenda expeditiously

☐ Other:

INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☒ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☒ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☐ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatior
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

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January 30, 2009

Mr. Charles Terreni
Chief Clerk
Public Service Commission of South Carolina
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In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina
Docket No. 2008-196-E

Dear Mr. Terreni:

Enclosed please find for filing and consideration the original and ten (10) copies of the Brief of the Intervenor Friends of the Earth, together with Certificate of Service reflecting service upon all parties of record.

With kind regards I am

Sincerely,

Robert Guild

Encl.s
CC: All Parties

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2008-196-E

In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina	)	CERTIFICATE OF SERVICE

I hereby certify that on this date I served the above Brief by placing copies of same in the United States Mail, first-class postage prepaid, addressed to:

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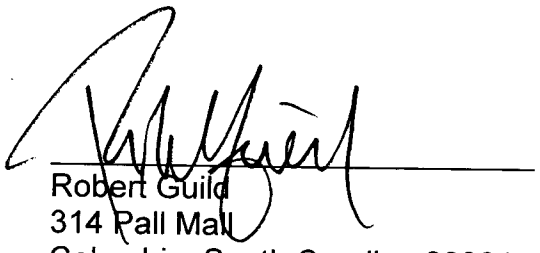
January 30, 2009



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BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2008-196-E

In Re: Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina	**BRIEF OF INTERVENOR FRIENDS OF THE EARTH**

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BEFORE

THE PUBLIC SERVICE COMMISSION OF

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DOCKET NO. 2008-196-E

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Pursuant to the Utility Facility Siting and Environmental Protection Act, S.C. Code Ann. Sections 58-33-10, et seq., and the Base Load Review Act, S.C. Code Ann. Sections 58-33-210, et seq., Intervenor Friends of the Earth ("FoE"), on behalf of its members who will be adversely affected, hereby submits this Brief urging the Commission to deny the Combined Application of South Carolina Electric & Gas Company ("SCE&G") for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina.

SCE&G's Combined Application for authority to build two new nuclear reactors at its V.C. Summer site in Fairfield County, South Carolina and for substantial rate increases to finance their construction is a risky and imprudent venture. SCE&G's pioneer application represents the first request for construction approval in the nation

by the smallest of the utilities embarking on the so-called nuclear renaissance. The chosen reactor type, Westinghouse's AP1000, has never been built before and is undergoing continual design changes which threaten the Company and its rate payers with spiraling increases in construction costs and delays in the construction schedule. SCE&G's cursory analysis of the need for new generating capacity and of the alternatives of increased energy efficiency and renewable sources such as solar and wind generation are grossly inadequate. Demand reduction and renewables are less costly and less risky than building these new nuclear reactors. Additionally, since no long-term disposal facility for high-level nuclear waste exists, the operation of these new reactors will only increase the nuclear waste management risk to South Carolina. This proposed gamble by SCE&G with ratepayers' money should not be permitted.

As supported by the expert testimony of former Commissioner Nancy Brockway and the other compelling evidence on this whole record, Intervenor, Friends of the Earth urges the Commission to deny the application, and direct the Company to undertake a thorough and complete resource planning process, with suitable stakeholder input. The Commission should order that, if the Company chooses to submit a new application, it must contain (a) an adequate DSM and alternative energy analysis, (b) a new and updated cost estimate for all generation options, including the proposed reactor project, c) a thorough analysis of the financing of the proposal, including all sources of non-ratepayer financing, details of financing for any joint owner, such as Santee Cooper, and the impact of the economic crisis on the financing of the project and the Company's financial health, (d) an explanation of how the Company would proceed if full DOE loan guarantees and other federal assistance are not

obtained, (e) an analysis of the risks to the Company and consumers from a proposal to invest an amount roughly equal to the net worth of the Company, and (f) how the customers would be protected from risks accepted by the Company on their behalf, such as large cost escalations.

If the Commission does not wish to deny the application outright, the Commission should defer the consideration of any precompletion approval of the Company's plans under Base Load Review pending (a) a return of the financial markets to solvency and stability, (b) a reassessment of the load forecast and financial analysis underlying the plan in light of recent economic events, c) an adequate assessment of the risks of the present plan, (d) an adequate assessment of the opportunities for other means to meet (updated) forecast needs, and (e) a full opportunity for stakeholder involvement in the Commission's determination regarding any new proposal the Company may make to construct one or more large central-station nuclear generation plants and obtain pre-approval of any associated costs.

If the Commission determines it is appropriate to proceed forthwith to grant the Company's proposal, the Commission should make it clear that the Company assumes the risks identified in this docket that pertain to its choice of two nuclear generation facilities. That is, if the Commission approves the Company's proposal for a Base Load Review order, the Commission should determine that no further adjustment to the approved schedule or budget for completion of the plant may be made on account of the risks determined by the Commission to have been inadequately considered by the Company, and that to the extent the Company makes changes to the schedule or the budget as the result of the occurrence of the factor found to pose such a risk, the

Company may not seek an increase in rates or extension of depreciation or amortization to recover any costs above those approved in this docket. Thus, where the Company has publicly projected that construction, financing and operating costs of the proposed nuclear units will not exceed $6.313 billion, the Commission could condition approval of the application on a prohibition on recovery by the Company of any rates higher than the level projected by the Company in this docket. Stated another way, where the Company has publicly claimed in its advertising that the output from this nuclear project will be electric generation costing ratepayers only 7.5 cents per KWH, it should be held to this promise.

The Combined Application of South Carolina Electric & Gas Company for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina should be denied where, pursuant to the Utility Facility Siting and Environmental Protection Act, S.C. Code Ann. Sections 58-33-10, et seq., and the Base Load Review Act, S.C. Code Ann. Sections 58-33-210, et seq., the Applicant has failed to establish that: A) public convenience and necessity justify permission to proceed with initial clearing, excavation, dredging and construction, contrary to S.C. Code Ann. Section 58-33-110(7); B) the Applicant has failed to fully and accurately describe and establish a description of the facility to be built, the environmental impacts of the facility, the need for the facility, and other relevant information, contrary to S.C. Code Ann. Section 58-33-120; C) the Applicant has failed to demonstrate the basis of the need for the facility, the nature of the probable environmental impact of the facility, that the impact of the facility upon the environment

is justified considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations, that the facilities will serve the interests of system economy and reliability, that there is reasonable assurance that the proposed facility will conform to applicable State and local laws and regulations, and that public convenience and necessity require the construction of the facility, contrary to S.C. Code Ann. Section 58-33-160; D) the purpose of protecting customers of investor-owned electrical utilities from responsibility for imprudent financial obligations or costs will not be served, contrary to Section 1(A) of 2007 Act No. 16; E) the Applicant has failed to meet its burden of proof that the decision to build the plant was prudent; F) the Applicant has failed to fully and accurately describe and establish (1) information showing the anticipated construction schedule for the plant; (2) information showing the anticipated components of capital costs and the anticipated schedule for incurring them; (3) information showing the projected effect of investment in the plant on the utility's overall revenue requirement for each year during the construction period; (4) information identifying: (a) the specific type of units selected for the plant; (b) the suppliers of the major components of the plant; and ©) the basis for selecting the type of units, major components, and suppliers; (5) information detailing the qualification and selection of principal contractors and suppliers, other than those listed in item (4)©) above, for construction of the plant; (6) information showing the anticipated in-service expenses associated with the plant (7) information required by Section 58-33-270(B)(6); (8) information identifying risk factors related to the construction and operation of the plant; (9) information identifying the proposed rate design and

class allocation factors to be used in formulating revised rates; (10) information identifying the return on equity proposed by the utility pursuant to Section 58-33-220(16); and (11) the revised rates, if any are requested, that the utility intends to put in place after issuance of the resulting base load review order, contrary to S.C. Code Ann. Section 58-33-250; G) the Applicant has failed to demonstrate that the utility's decision to proceed with construction of the plant is prudent and reasonable considering the information available to the utility at the time, contrary to S.C. Code Ann. Section 58-33-270; and H) the Applicant has failed to demonstrate that plant will be used and useful for utility purposes, and that its capital costs will be prudent utility costs and expenses, contrary to S.C. Code Ann. Section 58-33-275.

South Carolina Electric & Gas responds to critiques of its filing in this docket as if to say that the burden is on those who question its proposal to develop alternative plans and prove they are superior to its plan. This approach to the Base Load Review Act would put customers in the position of making a huge investment in the Company's project on the basis of little more than the utility's say-so that the project is superior. As *"trustee," in effect, of the consumers' funds, the Commission should conduct a thorough due-diligence review of the proposal, and require the utility to show that it is proposing the best plan for its South Carolina customers.

The evidence in this docket shows that the Company has not adequately analyzed its options, nor its forecast needs and resources, particularly in light of recent developments in the economy and financial markets. Nor has SCE&G seriously considered the impacts of the current economic crisis on its proposal. By contrast, Duke has slashed its forecast, and put its nuclear expansion plans on hold, at least

until the depth and scope of the financial crisis is resolved.

SEC&G would significantly lower its risk profile if it pursed a more modular resource development program, instead of placing a bet at least twice as big as its rate base on one untested technology, especially using ratepayers' money. The Commission should reject the application, or at least defer it to allow the utility to better develop its integrated resource plan in light of recent developments; and complete the promised outside review of energy efficiency and demand side management opportunities to reduce the need for new capacity.

If the Commission determines that the project should move forward, it should so condition the utility's recovery of associated costs so that the utility is held to the promised benefits implicit in its analysis of the merits of its proposal. Such a condition is entirely consistent with the Base Load Review Act and reasonable expectations of the finance community as well as the Company's ratepayers.

1. THE APPLICATION SHOULD BE DENIED BECAUSE THE COMPANY HAS FAILED TO DEMONSTRATE THE PRUDENCE OF ITS DECISION TO BUILD THE TWO PROPOSED NUCLEAR UNITS TO MEET ITS CUSTOMERS' ENERGY NEEDS.

Electric utilities have an obligation to serve the public. This obligation is generally understood to include the obligation to forecast the electricity needs of the customers in their service area, and plan to obtain sufficient resources to meet those needs.

The first step in the resource planning process is the determination of need. The

first step in determining electricity needs is the preparation of a forecast of the utility's probable loads and energy requirements, assuming no incremental utility intervention on the demand side. Next the utility reviews its current portfolio of resources, to determine which existing resources will be available at which times over the planning horizon.

Once the utility has prepared its initial forecast of loads and resources, it determines the amount and timing of any shortfalls between currently forecast resources and forecast energy and demand requirements. The utility then develops an array of all reasonable alternatives to meet any shortfalls so identified. This array includes central station generation using various fuels and technologies (base-load, intermediate and peaking), as well as a variety of forms of dispersed and customer-side generation, and all potential incremental demand-side management impacts. To be reasonable, the alternatives must enable the utility to meet all its lawful obligations, including environmental and siting constraints, for example.

Once the need is forecast and reasonable alternatives are identified, the utility prepares a number of alternative scenarios, matching different groupings of potential resources to the forecast needs. The utility prepares estimates of the net present value of costs of the various scenarios, performs sensitivity analyses of the cost of the scenarios based on reasonable possibilities of changes in any major component of the estimate (such as load forecast or construction cost forecast, e.g.), performs iterations as the analysis suggests might lead to a superior plan, and identifies the package that will meet the resource needs of the service area at the lowest estimated net present value over the planning horizon, at a reasonable level of risk in light of possible

contingencies.

A utility should also engage the public and key stakeholders at all stages of the planning process. Particularly where a planning process is drawn out and takes place in several stages over several months or even years, it is prudent to obtain input from the public and stakeholders on the various processes and results of different stages. Such involvement as the process unfolds averts the situation in which the Company completes an extensive planning process and commits to a certain course of action, only to receive input from the public and stakeholders that, if considered earlier in the process, could have led the Company to a superior course of action.

In 2005, according to Company witness Kevin B. Marsh (p. 18 of his Direct Testimony), SCE&G "began the process of evaluating nuclear generation load options..." By 2005, according to Mr. Marsh, SCE&G had determined that, "to meet its forecasted requirements for new base load generation it would need to make a decision as to the viability of construction nuclear generation in the 2006-2008 time period." A description of the Company process is set forth in more detail in Dr. Lynch's testimony. As I discuss below, it is not clear that the Company performed any serious comparisons of its preferred option to other possible scenarios. In addition, I understand that the Company asked the Commission to defer consideration of its integrated resource plan (or IRP) until the instant proceeding, thus assuring that no public or stakeholder review or Commission approval of its planning process could occur independent of the decision on this nuclear project. Direct Testimony of Nancy Brockway, *passim.*

ORS witness Zhen Zhu admitted that the most recent demand forecast for the Company which he reviewed for his prefiled testimony filed on October 17, 2008, was

the forecast included in the Company's May 2008 IRP update. Zhen Zhu, 12/10/08, Tr.2106, l 7. "I don't have any information beyond that because what I received, all this information, is contained in that May 2008 IRP." Zhen Zhu, 12/10/08, Tr.2106, l 10. Much has happened since then which reflects adversely on the variables relied upon in the Company's forecast model- measures of economic well-being and activity. Id. Ll 13-17. Witness Zhen Zhu acknowledges that such economic conditions are perhaps the worst since the Great Depression: "Could be, I don't know exactly. " Id., l 20. In any event, such measures of economic well-being and activity are generally significantly lower today than they were in May of 2008. Id., ll 22-25. Earlier demand forecasts by the Company, especially that for 2001, included "relatively large forecast errors. Id. Tr. 2109. Such errors included an overforecast of industrial sales, due, perhaps, to an over-optimistic economic forecast. Id., Tr. 2109, l 25- Tr. 2110., l1. In any event, the ORS panel did not make an independent forecast of future energy or demand growth for the Company. Id. Tr. 2112, ll 2-6.

The Company has not adequately supported its choice of baseload generation as the best option to meet forecast needs. Direct Testimony of Nancy Brockway, *passim*. The Company does not explain how it determined that incremental baseload generation owned by the Company was the preferred option to meet forecast demand and energy requirements, beyond noting its historical reliance on this type of resource. The Company appears to have let its assumption that baseload generation plant would be the best resource to meet future needs dictate its planning from that point forward, without considering, and modeling, scenarios including intermediate and peaking options, including alternative sources of generation, as well as demand side

management.

According to Mr. Marsh and Dr. Lynch, the Company determined it had a window of opportunity expiring in 2008 to assess the nuclear option and to have a nuclear generation solution in place by the time of its forecast capacity shortfall. On this basis, the Company looked at the nuclear option and considered non-nuclear baseload generation options.

The Company looked at coal and natural gas generation as alternatives to nuclear generation, to meet its forecast resource needs. The Company states that it had information concerning the costs of coal and gas generation, and accordingly that it focused its evaluation on the nuclear option.

According to Mr. Marsh, the Company initially decided on the Westinghouse AP1000 design in the 2005-2006 time frame. In 2006, SCE&G began its negotiations with the consortium of Westinghouse and Stone & Webster for two AP1000 units. Mr. Byrne states that in 2006-2007 the Company did re-evaluate the choice of the AP1000 design over the General Electric "Economic Simplified Boiling Water Reactor" (ESBWR) and the UniStar/Areva "Evolutionary Power Reactor" (EPR), the competing new nuclear generation designs. Meanwhile, the AP1000 negotiations continued through May 2008, when SCE&G signed the EPC Contract.

According to Mr. Marsh, the Company put in "several years of intensive study, evaluation and negotiation," leading to the May 2008 signing of the EPC Contract with the AP1000 consortium. The intensity of the study, evaluation and negotiation would have made it difficult for the Company to pursue any other baseload generation option, much less a more comprehensive, multi-resource approach to meeting its forecast

needs. Indeed, the Company does not describe any process by which it reopened the choice of baseload generation, nor the choice of the nuclear option within baseload options. From what appears in the filing, the Company during this period did not consider any non-baseload-generation option, including demand side management or additional off-system purchases. The Company was focused entirely on the nuclear option, and specifically on the AP1000 option.

There is no evidence that the Company seriously considered any alternatives aside from its own baseload generation, and in recent years, nuclear generation. The Company did put together a filing that includes a discussion of its understanding of the merits of these options. However, the non-nuclear options discussion appears to have been an after-the-fact justification of the original decision to focus on baseload nuclear generation, rather than a serious effort to determine all reasonable options. In general, the Company's filing indicates that it gives insufficient weight to alternatives such as Demand Side Management, wind, solar, and other resources for meeting its anticipated resource needs, particularly in light of today's economic circumstances. Direct Testimony of Nancy Brockway, *passim.*

Clemson University, Coastal Carolina University and Santee Cooper are working together to perform a South Carolina Coastal Wind Resource Assessment. They are identifying areas where sufficient wind exists to justify installation of wind-powered electricity turbines. It is true that the power available from a wind turbine is often much lower than its nameplate capacity. But that does not keep utilities across the country from including wind as an important resource in their portfolio, making the proper adjustments to their estimates of the likely production from the turbines. Two of its

major load centers, Beaufort and Charleston, are on the coast. Also, the Company will bear a cost for transmitting its baseload nuclear from the site to its load centers. The relative costs would have to be analyzed in a serious study of the wind option.

The Company here, as in the case of other options, sets up a straw man, by calculating what would be required to displace 2,234 mW of generation. Just because it would be expensive or difficult for any single other source of generation to produce 2,234 mW does not mean that other sources of generation could not be part of a superior alternative portfolio. In addition, the record does not detail Santee Cooper's need for its 1000 mW share of the two nuclear generators, and thus nothing to prove how much more than SCE&G's 1,229 mW needs to be put together to serve the Company's anticipated load.

It may be that large "central-station" arrays of concentrating solar energy are not the most suitable for South Carolina, at least with present technology. However, Duke has recently announced that it would buy approximately 16 mW of energy from a large photovoltaic solar farm, which is being built in Davidson County, North Carolina by SunEdison. Also, South Carolina already make use of distributed flat panel solar power, both for direct heating (e.g. water heating) and for photovoltaic generation of electricity. Duke in North Carolina has also proposed to invest $100 million to install photovoltaic solar panels at up to 850 sites in North Carolina, including homes, schools, stores and factories. Thus, a major utility in a close neighbor to South Carolina has chosen to invest in both concentrated and distributed solar power, suggesting there is more potential for such a resource in South Carolina than SCE&G considers viable.

It is true that renewable sources of power have historically been more expensive

than fossil fuel generation, and have produced power at higher costs than nuclear operating costs. However, the costs of alternative forms of power generation are continuing to come down, as society puts more resources into their development. Also, the costs of nuclear power are high, and budgets and estimates for such plants are subject to considerable risk of understating the ultimate cost of such power. Estimates of both sorts of resources must be continually updated to reflect changes in their underlying costs and risks.

The Company's filing shows that its estimate of DSM potential to reduce peak demand goes down by 25 mW from 2008 to 2009, and then stays at this lower level through the planning process. The Company does not justify its apparent determination that as of 2009 it will have exhausted all demand-reduction potential via DSM. Indeed, the Company states that it is exploring with consulting firm ICF the possibilities of increasing its DSM resources. The Company states that demand reduction could not make up for the 1,229 mW of power it says it will need. As with wind and other generation options, this is the wrong test. Rather, the Company should ask whether additional DSM could contribute to a plan that could replace the 1,229 mW of nuclear power the Company has chosen to obtain. The Company does not ask itself this question, nor answer it.

Some states have achieved dramatically higher levels of savings. For example, through a combination of building and appliance standards and demand-side management programs, California has held its per capital consumption of electricity to roughly 7,000 kWh from 1975 through 2004, compared to the growth from 8,000 kWh to 12,000 kWh in the national average electricity consumption over the same period.

See Exhibit NB-2. California has achieved these results without depressing its economic vitality. The lower average kWh savings from utilities in the Southeast is likely the result of the more recent focus on DSM in this region, rather than the fact that it is a warm-weather region. Indeed, the presence of a greater concentration of air conditioning in the Southeast than some other regions where DSM has been pursued for 25 years or more suggests greater potential for savings in the Southeast than in some less electricity-intensive regions. For example, utilities such as Gulf Power have had success in obtaining demand reductions through their residential air conditioning load control *programs, but SCE&G has no such offering. Ms. Brockway's Exhibit NB-3 is a table drawn from DOE EIA data, showing that a number of utilities around the country have been able to harvest significantly more energy and demand savings than the Company acknowledges are possible. While there are differences in service areas, South Carolina still has the potential for considerable cost-effective efficiency investments.

Based on her 25 years of experience in the area of Demand Side Management, it is Ms. Brockway's expert opinion that SCE&G has not yet undertaken any significant DSM initiatives. That is, few savings have been harvested compared to the likely technical and economic potential for electricity savings in the service area. The initiatives undertaken by the Company are, with the possible exception of interruptible load rates, not designed in a way likely to produce noticeable energy or demand savings. This observation further supports her opinion that SCE&G has not adequately counted the potential for meeting future resource needs through DSM.

By "significant DSM initiatives," Ms. Brockwayl means DSM initiatives that are

calculated to save and have saved significant amounts of electricity usage, including usage on peak. SCE&G claims that it has had a DSM program in place for many years, but its program consists of efforts that are not likely to have much success in overcoming the market barriers that keep residential and business customers from investing in the electricity-saving options available.

From the beginnings of DSM at the Maine Commission in 1983 to the present, the objective of utility efforts has been to overcome the market barriers (or imperfections) that prevent customers from choosing the efficient option (the efficiency "measure"). There are a number of such barriers. The primary barriers relate to the fact that efficiency measures often have higher upfront costs than less efficient options. This fact in turn causes many customers to choose the less efficient options. Even knowledgeable and interested customers often face such remaining market barriers as a lack of the cash to pay the higher upfront cost, an inability or unwillingness to undertake debt to pay for the higher upfront cost, a lack of confidence that the measure will work as promised to save the promised energy, and a lack of confidence that they will remain in the premises long enough for a measure to pay back the incremental upfront costs via bill savings.

Company Information only programs do not represent a serious attempt to reduce customer usage or peak. DSM evaluators do not even attempt to count savings from information programs - it is not possible to perform a valid evaluation that identifies savings resulting from such programs. Information alone is typically not enough to motivate a choice of the alternative.

Information programs address only two of the market barriers customers face

when choosing between an efficient option and a less efficient (but less expensive or more familiar) option: lack of knowledge about the alternative, and lack of knowledge about the savings potential of the alternative. Information overcomes none of the key barriers. It only results in a public that is more aware it is not doing enough, but is no more able to make the incremental investment than before.

The three Company-identified initiatives in combination fail to overcome the most important market barriers for most customers, including high upfront costs, inability or unwillingness to take on more debt, and lack of confidence in the achievement of the promised payback. Value Visit adds an upfront barrier, the $25 charge for the so-called audit; this in itself deters many customers. Direct Testimony of Nancy Brockway, *passim*. In its application, Exhibit G, the Company points to three statistics as measures of success of its demand side management programs:

*Almost 200,000 customers are registered for internet access (for efficiency tips);

* Over 50,000 customers are on the Conservation Rate; and

* 20% of commercial sales are served on TOU or RTP rates.

The mere fact of registering for internet access to obtain efficiency guidance tells us nothing about how many registered customers took what actions that have saved what kWh and kW as a result of such access. The number of customers on the Conservation Rate tells us nothing about whether customers would have taken the steps towards efficiency they did without the benefit of the lower rate. The fact of a lower rate (or on-the-bill-financing without more) does not overcome the problem of upfront cost differentials, inability or unwillingness to take on debt, and lack of

confidence in the payback of the investments. Thus, many customers who could contribute significant savings cannot take advantage of such offerings. Also, the program relies on a limited range of lower-cost measures, and thus likely does not address the potential for greater savings available with higher levels of investment. The fact that 20% of commercial sales are made on TOU or RTP rates similarly does not demonstrate that the customers taking service on these rates have done anything to change their premises, equipment or processes to achieve greater efficiency or further move load off peak. The Company's statistics measure activity, not results.

A variety of studies have suggested that it would be cost effective to substitute efficiency for a much as one-quarter of our electricity usage. Direct Testimony of Nancy Brockway, *passim*. In addition, demand side management experts are developing new techniques to overcome some of the persistent market barriers that have limited the extent to which utilities, even in states like California and Vermont with relatively high levels of DSM spending, have been able to harvest all cost-effective efficiency. Renewed attention to the problem of persistent market barriers is likely to expand the range of programs significantly beyond not only the information programs emphasized by the Company, but beyond the incentive and rebate programs that characterize the portfolio of the most successful DSM providers today.

The Company does not and cannot contend that the Commission has approved its plans, merely because they have been filed.

The Company itself admits that it has only recently hired ICF consulting firm to do a plan for DSM programs, undertaking research and planning that the Company has

not undertaken itself or by contract to this date. ICF's analysis is not scheduled to be presented before the summer of 2009. Also, South Carolina since 1993 has allowed electric utilities to obtain cost recovery for its DSM programs, including the value of its lost revenues and return. SCE&G has not taken advantage of the South Carolina law to propose rates that would implement an effective DSM program.

Brockway was not alone in her criticism of the Company's DSM efforts. ORS witness Evans acknowledged the Company's flawed and inadequate DSM program: "One thing, to let you know, I think we were very critical of the company's DSM efforts." Evans, 12/10/08, Tr. 2255 ll 10-12.

Dr. Ronald Wilder, Distinguished Professor Emeritus of Economics in the Moore School of Business at the University of South Carolina, testified on behalf of the Intervenor, Ruth Thomas. Wilder, 12/4/08, Tr. 1282. In Dr. Wilder's expert opinion there is greater potential for Demand Side Management savings at SCE&G than presented by the Company in its testimony. "Our State is certainly not a leading state in energy conservation incentives. And I believe and hope that that will change." Id., Tr. 1297, l 17. South Carolina ranks 34th, "somewhat behind" in energy conservation and energy efficiency programs, and could do better. Id., Tr. 1299 ll 10-14. In his opinion the Commission is empowered to and should require more energy efficiency and conservation effort by the Company. Id. Ll 18-25.

The main advantage of DSM is its low cost relative to the cost of generation. The same dollar of spending on efficiency will produce greater "negawatthours" than the same dollar will produce "megawatthours." Further, DSM and smaller resource options are modular resources. Their contribution can be ramped up and down depending on

changing forecast requirements. Such modularity makes it considerably easier to finance these alternatives, relative to a large central-station generation option, nuclear or otherwise.

Company witness Lynch continues to ignore information that supports the viability of wind and solar for South Carolina. Dr. Lynch argues that there are presently no offshore wind power installations in the United States. This is true so far as it goes, but misses *the larger picture and ignores the fact that neither are there any of the AP 1000 design nuclear plants in actual service. The Company ignores the extensive and successful track record of off-shore wind installations in Europe, as well as the growing level of commitment to off-shore wind, worldwide and in the United States. There are presently over 1,000 mW of off-shore wind generation already in operation. Another 3,000 mW is in the planning or construction stages. Closer to home, the states of Delaware, Rhode Island and New Jersey have recently announced plans to move ahead with offshore wind as key resources in their state's generation portfolios. New Jersey's Governor has just announced plans for that state to develop 3,000 mW off the Jersey shore by 2020.

Dr. Lynch implies, but does not say directly, that but for the state portfolio standard, Duke would not invest in its solar options in North Carolina -- he notes that Duke is subject to a renewables standard in that state. There is no reason for Dr. Lynch to dismiss Duke's initiatives in the area of renewables and other alternatives because in some states they are consistent with a state mandate. Further, there is growing sentiment for a renewables standard as well as increased energy efficiency in South Carolina. The South Carolina Climate, Energy & Commerce Advisory Committee

(CECAC), a body including senior representatives of all of the state's major utilities, among them Mr. Marsh of SCE&G recently released its report, EX. NB-4, in which by a supermajority vote the Committee calls for development of state "energy portfolio standards" under which 5% of retail electricity needs would be met by efficiency and 5% by renewable energy by 2020, for a total of 10%. This local interest in renewables is mirrored by growing support nationally for a commitment to obtain a significant portion of our electricity from distributed, renewable resources. For example, over two-thirds of Missourians in the most recent election supported a Clean Energy Initiative for their state, which made Missouri the 28th state to pass some form of a mandatory renewable portfolio standard. The Missouri initiative requires the state's three largest electric utilities to generate or purchase at least 15 percent of their energy from renewable sources by 2021. In addition, the campaign web-site of the President-Elect promises that the new Administration will implement a federal Renewable Portfolio Standard (RPS) to require that by 2012, 10 percent of electricity consumed in the U.S. be derived from clean, sustainable energy sources, like solar, wind and geothermal. A winning candidate's promise does not put a policy in place, but it provides some indication of the direction the country is moving in.

By 2020, under the Company's existing (pre-September 15) load forecast (Application, Exhibit G, p. 3 of 3), the Company's firm obligation will be 6037 mW. Five percent of this amount would be just over 300 mW. This amount in turn represents about half of the capacity the Company proposes to bring on via its AP1000 plants.

Just knowing the per kW installation costs of any form of generation is not sufficient to assess its long run economics. One has to take into consideration the net

present value of operations and capital additions costs over the forecast horizon, at least. Solar costs virtually nothing to operate. The costs of solar installations continues to come down, as further research and greater commercialization of the technology continues. The United States DOE Solar Energies Technologies Program recently projected that per kW-installed costs of solar will be reduced to half of today's prices by 2015, and that this trend means solar power will be competitive with conventionally-generated power by 2010.

A good example of why the Company's position is internally inconsistent can be seen by comparing Company witness's assertions to the effect that the utility has included the maximum feasible DSM in its scenarios, with their simultaneous acknowledgment that the utility has yet to complete its ongoing consultant study of DSM potential for its region. The utility cannot know if it has included the maximum feasible DSM until it has finished its study and the study has been subjected to public review.

As for price differentials between South Carolina and California, Dr. Lynch glosses over the fact that at the beginning of the period of energy intensity comparisons and California's diversion from the national trend, California already had higher prices than South Carolina. One would have expected that usage in earlier years would have also been suppressed, if price elasticity were the whole story. Further, Dr. Lynch ignores the fact that the Company's own price projections forecast SCE&G's retail rates being pushed up by just under 40% by the costs of the proposed AP1000 investments. This forecast does not even taken into account the likelihood of cost overruns, and it does not account for the further price increases the Company will seek to obtain a return *of* its investment, rather than the costs it seeks in this docket. If retail price is as

powerful a motivator of customer efficiency as Dr. Lynch suggests, then it is important to consider the likely impact on demand of the rate increase needed to cover depreciation of the plant balances. As in the 1970s and 1980s, the Company (and its ratepayers and Commission) could end up paying for a plant that is no longer cost-effective because the very cost of the plant has deferred resource needs. Finally, with respect to the relatively modest levels of DSM achieved by utilities in the Southeast, per the Form 861-A data, Dr. Lynch does not note that utilities in the Southeast have not historically invested heavily in efficiency, and their DSM offerings, like those of SCE&G, do not tend to address the market barriers that effective DSM programs are designed to overcome. There is great room for superior performance in the future.

As Dr. Lynch highlights in his rebuttal, the term demand-side management or DSM includes two concepts that can and should be distinguished. "Demand response" refers to reduction in instantaneous loads at peak times, or capacity requirements (kW). The utility's interruptible rates are examples of demand response efforts. "Energy efficiency" is the other aspect of DSM, and refers to the reduction in usage (kWh) made possible by energy-saving measures such as higher-efficiency air conditioners. Energy efficiency typically includes savings at peak hours, and these peak savings have a value as demand response as well. By contrast, demand response typically only helps address peak load requirements, not baseload needs. [Note that the economic term "demand", as used in my direct testimony at p. 20, can be confused (as Dr. Lynch has evidently done) with the concept of peak demand. When used as an economic term, as in my direct testimony, "demand" can refer to "demand" for capacity, or to "demand" for energy.] In any event, the Company cites its demand response efforts as if they

could substitute for energy efficiency in its planning and scenario building. If the Company indeed requires baseload generation, as it asserts, it will get more value from its DSM initiatives if it includes significant energy efficiency.

Dr. Lynch is repeating some of the tired old arguments that used to attack regulatory demand-side management years ago. Utilities routinely argued that they could not measure DSM with sufficient precision to include its effects in their load forecasts, or use such estimates as a basis for portfolio decisions. This argument may have had some merit 30 years ago, but it is completely discredited today. In the last quarter century, hundreds of double-blind, controlled evaluations of efficiency results from DSM activities have been conducted. The methodologies for evaluating the results of DSM programs have been carefully developed by analysts. Standard protocols for determining results are in use around the United States (and indeed, around the world). Estimating the likely effects on load forecasts of various DSM initiatives is as reliable as any other element of the utility's load forecast. Utilities today include DSM estimates as a matter of course in their planning. The forecast cost and schedule of the proposed AP1000 plants is subject to at least as much uncertainty, if not more. And the utility can respond to errors in forecasts of DSM potential by adjusting its plans, whereas a commitment to a several-billion nuclear plant cannot be unwound without considerable loss, loss that would likely be borne by the ratepayers under the statute.

Recall that CECAC has called on South Carolina to implement an energy efficiency standard of 5% by 2020. If SCE&G were to meet such a standard, it would reduce its requirements significantly by 2016, and even more by 2019.

As in the case of renewables, Dr. Lynch and Mr. Byrne testify on rebuttal as if each alternative, whether renewables, DSM or power purchases, must be able by itself to satisfy all the reasonably forecast needs for new resources over the planning horizon. It is this concept to which in the Company's arguments on DSM and renewables which should be called "straw men." Common sense dictates that the question is instead whether there are reasonable alternative scenarios, involving various combinations of such alternatives that taken together can supply the capacity and energy needed to serve the Company's customers, and at competitive prices with less risk.

Continuing with the consideration of the CECAC recommendations, if one were to combine at 5% efficiency goal and a 5% renewables goal for the 2020 time period, and one assumed a continuation of power purchases at the level the Company assumes for the year before its first proposed generating plant comes on line, the Company could by this combination of factors achieve a reserve margin in the same area as its target in this docket, even if demand is not reduced by the ongoing economic downturn.

Even if the CECAC proposal were adopted, it would not make sense to ask each utility in South Carolina to add nuclear power equal to 6% of its 2020 requirements. For SCE&G, 6% would represent around 350 mW. Nuclear power today can only be implemented through large central stations, so under this view of the CECAC proposal SCE&G would have to build a large plant and sell most of the output. This makes no sense for a utility of SCE&G's size. South Carolina could implement the CECAC recommendations without requiring SCE&G to build a 350 mW nuclear plant.

Mr. Byrne does not address the possibility that others in the region who are developing large central stations may wish to sell some of the output. For example, although its Lee nuclear plant plans are on hold, Duke has expressed n interest in selling some of the output if that project is completed. At the hearing in North Carolina on Duke's proposed contract for sales to Orangeburg (North Carolina Utility Commission Docket No. E-7, Sub 858, November 5, 2008), Duke Energy Corporation's Vice President of Business Development & Origination, Mark A. Svercek, testified that in addition to Orangeburg and Greenwood, Duke is in serious discussion with seven other entities outside of its service area for off-system sales to them. Contrary to Mr. Byrne's testimony, then, at least Duke appears to be pursuing power sales and might be able to supply power to SCE&G on favorable terms.

The utility's arguments on this ownership preference, raises an eerie sensation of "déjà vu" dating back almost 30 years. At that time, electric utilities across the country insisted that their loads were growing fast, and that the only alternative was for them to build, or at least participate as a joint owner in, new central station (mostly nuclear) power plants. As with utility refusals to count DSM as a resource, utility preference for ownership in the 1970s and 1980s did not translate to the desired greater certainty or control on the part of the utility. What had worked when plants were relatively smaller and more modular no longer worked when the central station play represented a huge portion of the utility's rate base. In the case of nuclear plants in particular, the untested and changing design requirements of the plants led to costly delays and burgeoning costs. The result was an erosion of earnings quality or higher rates, or both, given the magnitude of the investments relative to the existing rate base.

(Ironically, rate increases achieved to help pay for these investments in turn dampened demand, making the investments that much less cost-effective). Some utilities lost control of their destinies to the federal bankruptcy court. One of these was Public Service of New Hampshire, with which I am quite familiar. A relatively small utility, and determined to own its own power plant, PSNH bet the company on its Seabrook nuclear station. When other joint owners were trying to shed their commitments to the plant, to limit their exposure to the out-of-control costs of the plant, PSNH bought additional shares in an effort to keep the project alive, rather than turn its back on the Seabrook I project. Seabrook I did come on line, but as a result of its choice of technology and preference for ownership, PSNH ultimately filed for bankruptcy and was bought up by a larger utility. Meanwhile, New Hampshire was saddled with the highest rates in New England for many years. The high costs of the unfortunate nuclear investments was a major contributor to the push for restructuring of the industry in New England and California.

Ms. Brockway concludes that SCE&G has seriously underestimated the contribution to meeting its customers' resource needs that can be made by DSM, and has chosen a central-station generation alternative before giving DSM, and other options, adequate consideration. Direct Testimony of Nancy Brockway, *passim*.

2. THE APPLICATION SHOULD BE DENIED BECAUSE THE COMPANY HAS FAILED TO ADEQUATELY ASSESS THE COST AND RISKS OF THE TWO UNIT NUCLEAR PLANT PROPOSAL.

The Company's analysis of the relative merits of its proposal does not adequately reflect the likely costs of its proposed plant construction, and does not adequately account for a number of risks associated with the commitment to construct two large central-station nuclear generating plants, especially in light of the current economic crisis. Direct Testimony of Nancy Brockway, *passim.*

SCE&G proposes to spend at least $6.3 billion, its share of the $9.8 billion it estimates it will cost to construct two 1,117 mW nuclear generation plants, (Application Exh. F). This investment would translate to al cost of $5,138 per kW ($6.3 billion/1,229mW). It is not possible to develop an estimate of the overnight costs of the plant from The Company's estimate is lower than most estimates recently published:

Recent Estimates of Nuclear Generation Plant Costs, $/kW (all overnight estimates in 2007$ unless noted)		
Study/Source	**Overnight Costs**	**All-In Costs***
MIT 2003 (2002$, escalated by CERA PCCI)	$3882	*$7664*
Lazard		
Average of DOE Loan Guarantee cost estimates		*$6528*
Moody's Investor Service	n/a	$5000 - $6000
FP&L AP1000 (October 2007 application)	$3643 - $4587	*$5500 - $8100*
Jim Harding, June 2007	$4200	$4300-4550/kW (real) *$8400 nominal*
FERC Staff Study cited by S&P October 2008		$5,000 - $8,000
Keystone Center	$2950	$3600 - $4000
Progress Energy, Florida		$4,229/kW
S&P October 2008		$4000
SCE&G Exhibit F		$5138

* As given, or if not stated, derived by doubling overnight cost estimate (and shown in italics)

Moody's Investors Service is quoted as having released a "special comment" in October 2007, entitled *New Nuclear Generation in the United States: Keeping Options Open vs Addressing An Inevitable Necessity,* in which the ratings agency cautioned that its estimate of the all-in costs of a nuclear plant (between $5000 and $6000/kWe) was "only marginally better than a guess." The report went on to state that the Moody's estimate:

> ...is a *more conservative* estimate than current market estimates...All-in fact-based assessments require some basis for an overnight capital cost estimate, and the shortcomings of simply asserting that capital costs could be 'significantly higher than $3500/kWe' should be supported by some analysis. That said, *Moody's cannot confirm (and all of our research supports our conclusion) definitive estimates for new nuclear costs at this time.* Moody's can assert with confidence that there is considerable uncertainty with respect to the capital cost of new nuclear and coal-fired generating technologies, and that companies may decide not to proceed with financing and construction unless and until they have satisfied themselves (and, where necessary, their boards and regulators) that the investment is justified and that the plant can produce electricity and recover costs at a price that will not be overly burdensome to consumers. (emphasis supplied)

The Company states that the total costs of the plant are estimated to be $9.8 billion. Santee Cooper will pay 45% of the construction costs and take a corresponding ownership share. The Company will own 55% of the plants and be responsible for a corresponding share of the costs, or $6.3 billion under the Company's estimate of construction costs including AFUDC.

The Company's "pioneer" status in embarking on this new nuclear venture exposes it and its ratepayers to unique risks. Company witness Marsh acknowledged that SCE&G is a pioneer among utilities in proposing to build a new nuclear plant: the "first that has gone through the regulatory process" for construction authority. Marsh, 12/1/08, Tr. 203, ll. 14-15. To date, no AP 100's have yet been approved by the federal NRC. Id. Ll. 22-25.

Witness Marsh could not predict the price of electricity from the proposed plant, declining to agree that the plant output would not exceed 10, 11, 12, or any other price in cents per kwH. Id., Tr. 210, ll 16-22. While disputing that the proposed application provided a virtual "blank check" to the Company, Marsh was not prepared to commit to any maximum cost for the nuclear project for which the Company would seek ratepayer compensation. Id., Tr. 212, ll 2-21.

ORS witness Crisp acknowledged that the Company's $6.3 billion plant cost estimate assumed it would meet the minimum milestone construction schedule provided for in the Application, Crisp, 12/9/08, Tr. 2094, ll 4-17. The ORS consultants did not attempt to estimate the additional plant cost associated with the automatic 30 month schedule extensions proposed in the application. Crisp, 12/9/08, Tr. 2095, ll 4-5.

ORS witness Evans projected plant electricity production cost assuming what he characterized as "typical capacity factor for nuclear" of 95%." Evans, 12/9/08, Tr. 2102, l 13.. However, if the plant achieved only a 50% capacity factor during its first years of operation, he acknowledged that bus bar costs of electricity would be significantly

higher. Evans, 12/9/08, Tr. 2103, l 8.

The Company states that the first of the two units will be brought on line in 2016, and the second of the two units will be brought on line in 2019. The Company's schedule for construction of the two proposed nuclear generation plants is subject to a great deal of uncertainty. There is considerable risk that the schedule cannot be met, and it will take much longer to complete the two plants. Direct Testimony of Nancy Brockway, *passim*.

There are several reasons to doubt that the two power plants proposed by SCE&G can be completed on the schedule contained in the Company's filing. First, the Company proposes to build two Westinghouse AP1000 nuclear power plants. No plant of this design has ever been constructed. When a design of a complex machine like a nuclear power plant is put into bricks and mortar (or concrete and piping) for the very first time, it is common for the engineers, architects and builders to discover design issues that were not apparent in the design process. Addressing these issues can take time, and delay the scheduled completion. This is evidently happening with the new generation nuclear plant being built by Areva for Finland. Second, while the AP1000 design has been pre-certified by the Nuclear Regulatory Commission, that certification does not purport to guarantee that the design is free of flaws or anomalies. Third, the AP1000 design is not yet complete. There is no final design yet, and the design review is now on Revision 17. The NRC has no clear schedule for reaching a final design. There is no guarantee that a design will ever be recognized as final, yet a final design is

necessary before the NRC can issue a Combined Construction and Operating License (COL) to SCE&G. Fourth, it is likely to be 2012 at the earliest before a COL can be issued. The first plant is scheduled to come on line in 2016, a date that is unrealistic given the continued delays in developing a final design for the AP1000. Florida Power & Light, which recently obtained permission to proceed with two AP1000 plants, expects to complete the first of its two plants in 2018. SCE&G does not explain how it can be at least two years ahead of FP&L in completion of its plant. Fourth, if no COL is issued in 2012, there will be further delays, the length of which cannot be predicted. Fifth, large construction projects of any kind are subject to the risk of contractor error. Recall that the NRC approved the designs for Diablo Canyon nuclear station in California, and only after the plant was built in 1981 did engineers discover that the contractor misread the blueprints and constructed the facility in a mirror image of the actual plans. The plant could not be put in service as built. The construction error forced delays in opening the plant.

The Company's estimation of construction costs for the two nuclear generation plants is subject to a great deal of uncertainty. There is considerable risk that the cost to construct the two proposed plants will be much higher than the Company's estimate.

The most important source of uncertainty in the cost estimate is the uncertainty in the schedule, discussed above. The longer the construction time, the greater the likely escalation in costs of all inputs to the construction process, the greater the risk that intervening changes in NRC requirements will require expensive retrofits of what

has already been constructed, and the more the carrying costs of the investment will compound. Another key reason to doubt the Company's cost estimates in this docket is that they rely on forecasts of inflation in the construction of nuclear power plants that are well below the most recent rates of inflation in such construction. Also, the Company assumes it can get federal loan guarantees and other subsidies, whereas there is a limited pot of money that Congress made available, and there is no certainty that SCE&G will obtain the loan guarantees and other subsidies it says it needs. Further, the Company assumes a cost of capital that does not adequately reflect the added risks of nuclear plant construction. Also, the contingencies included by the Company in the public version of its Application appear to be low in some cases. Finally, the Handy-Whitman index used by the Company to develop escalation estimates shows considerably lower inflation in nuclear plant costs than does the index published by Cambridge Energy Research Associates, suggesting that the project risks considerably higher cost escalation than that reflected in the Company's estimates.

Putting aside the problem that the EPC contract is not public, it is likely that this arrangement with Westinghouse/Stone & Webster (Westinghouse) does not adequately protect SCE&G's customers from sources of cost escalation. First, significant portions of the construction will be priced under a Target Price structure which purports to provide for risk sharing between Westinghouse and the Company, but in fact provides a "profit minimum" assurance to Westinghouse. Exhibit C, pp. 3-4. This provision suggests an asymmetric allocation of risk away from Westinghouse and on to the

customers. Another major portion of costs are subject to escalation, and are not limited by indices or other controls on the rate of escalation. The fact that present-day design/build consortia have institutional memories of the great losses they incurred under turnkey contracts in the first round of nuclear construction suggests it is unlikely that they would allow themselves to be exposed to such high levels of risk. In addition, to the extent of pre-completion cost recovery by the Company from consumers, any risks of the contract are flowed through to consumers, and the Company's incentive to manage the contract carefully to squeeze out all waste and cost overruns is minimized if not eliminated.

There are several additional risks for the Company and its consumers from SCE&G's choice of this two-unit nuclear generation resource option. First, the security challenges for nuclear plants today are quite different from the situation when South Carolina first supported extensive investments in nuclear power. Second, the Company states that the plants will have 18 years of on-site waste storage. This will not be enough, even if the plants do not operate longer than 18 years (recall the Company assumes a 60-year life). Radioactive waste has a half-life of thousands of years. It is true that South Carolina already has a "nuclear waste" challenge, and it could be argued that adding the output of two new plants will not materially affect the magnitude of that challenge. But every metric ton of radioactive waste is another radioactive ton that must be managed and ultimately delivered to a permanent storage facility. (It bears noting that reprocessing will not solve this problem, and creates other problems).

And when South Carolina first embarked on its nuclear program, there was reason to expect that the federal government would take over and resolve the waste storage issue in a reasonable time. That reasonable time has long passed, with no permanent storage facility yet in sight. Finally, and perhaps most importantly, the sheer size of the proposed investment, relative to the Company's capitalization, creates enormous risks of inability to secure financing, inability to complete the plant, large stranded costs, and a utility whose capital is weakened for many years. This risk is only magnified by the current economic crisis.

While one cannot quantify the risk premium associated with the various risks to the Company and its consumers posed by its choice of the two-unit nuclear option; one can say, however, that the Massachusetts Institute of Technology in their 2003 study assumed a 3% return on equity risk premium for nuclear generation relative to coal and gas central station generation (Chapter 5, p. 15). MIT did not attempt to estimate the relative risk premium for nuclear plants and more modular resources such as alternative dispersed generation, a more varied portfolio, or demand side management. Whatever the risks of such alternatives, as a group they will have a lower risk profile, because investments in a portfolio of alternatives will not require such a concentration of risk in one project, as does the Company's proposal.

The Company's current capitalization is just under $5 billion. By 2019, assuming its cost estimates are correct, it will have more than doubled its capital investment. The Company is healthy today, but we saw in the first round of nuclear investments some

years ago the impact that such relatively large investments can have on Company financial indicators. When demand slacked off (in part in response to the very price increases brought about by the investment), costs escalated, and plants were delayed or even cancelled, many utilities in the 1970s and 1980s experienced severe financial distress. A less concentrated, more diverse and modular portfolio of new resources would be much less risky.

The Company is not altogether immune from the risks even if it receives current CWIP recovery, and in any event such current recovery merely transfers the risks to consumers. The Company does not adequately explain the level of non-customer financing it will require, assuming it proceeds with its *plans – even with CWIP recovery, and reality meeting all Company expectations, it is possible that the cost of raising the balance of funds will be a stress on the utility, which translates to higher costs of capital. Also, the current cost recovery sought by the Company will induce a reduction of future loads as the result of price elasticity, undermining the basis for proceeding with the plant. In addition, the extent of price increases will focus public attention on utility rates, and risks the introduction of short-sighted public intervention in ratesetting. Finally, the Company may be protected, but this will only occur by virtue of transferring the risk to consumers. As well, the cost-benefit analysis of the proposal does not take into account the fact that consumers will have an opportunity cost for the capital they must devote to the investment as they pay for the construction in progress.

The current financial and economic crisis exacerbates the risks that the

Company cannot get financing on reasonable terms, that the costs of financing will increase, that customers will cut back on usage and load forecasts will overestimate future demand, and that the need for this or any plant will be pushed back in time, especially as other utilities also see reduced demand and have additional amounts of power to make available to SCE&G. The crisis also puts in question the likelihood of additional federal subsidies for nuclear generation, at least in the short term, as the result of rising federal deficit *pressures. The logistical and labor constraints for key nuclear plant inputs may ease, but to what extent and with what cost ramifications is not clear at present. This easing may reduce cost escalation in the future, but whether it will bring it down to the levels anticipated by the Company is not known. As Standard & Poors noted in a recent research document, there are a number of drivers besides material costs that are pushing up the cost of nuclear plant construction:

> Construction risk is the overriding risk for new nuclear units. *We believe that labor and material cost increases are particularly acute for nuclear plants given their specialized labor needs, material intensity, and a tight supply chain for key components.* The *scanty construction track record* for the new technologies and *an untested regulatory process* only complicate the risks. *The ABWR has an advantage over other technologies* since four have been built and the technology has more than a decade of operating experience. EPR technologies will benefit from the fact that there are two reactors being built in Europe where construction is at least three years ahead of the Calvert Cliffs 3 plant. Thus, U.S. facilities will be able to learn from any difficulties confronted there. It is unclear how much risk technology vendors and construction contractors will be willing to assume in new nuclear plant construction. Construction exposure for ABWR and EPR also benefit from being evolutionary rather than revolutionary designs. While ABWR and EPR contractors have stepped up in varying degrees, we do not have enough information on the terms being offered by the AP 1000, ESBWR, or APWR contractors. *How much of these*

risks a developer is able to assign to vendors and how much cushion is available for risks that are retained by a project will be key drivers of credit quality. (emphasis supplied)

The United States is in a period of extraordinary volatility in the financial markets and recession. Few economists will attempt to predict with any basis or certainty how deep the downturn will turn out to be, how long it will last, or what impact it will have on future demand and costs related to the Company's proposal, (or to alternatives to the Company's proposal). Few will even attempt to predict when we will have a good idea of the likely course of events.

The Company's filing does not adequately take into consideration the risks that (a) its forecast overestimates the level of need for additional resources in its service area, (b) its cost estimate for the preferred option is too low, and ©) any cost estimate for the proposed nuclear generation plants is subject to a great risk of upward adjustment, (d) pursuit of its preferred option will put financial strain on the utility that will translate into the risk of higher rates for consumers, (e) the generation option chosen by the Company is new and may present construction and operational challenges that cannot be foreseen, and (f) the Company may be unable to complete the plant and put it into operation (at least on time and on budget) for a number of reasons, including difficulty obtaining a Combined. Operating License for the plant(s), the financial stress of the construction costs of two large central-station generators becoming too great for the Company and the service territory, and further financing

becoming impossible to obtain on reasonable terms. In addition, the Company's analysis ignores the cost of capital to the consumer, who is being asked to pay for the costs of construction. Direct Testimony of Nancy Brockway, *passim.*

Mr. Byrne argues in rebuttal that this scenario of costs getting out of control will not happen in the case of SCE&G for a number of reasons. First, he notes that the SCE&G proposal reflects "a superior construction site geologically; the benefit of having rail, electric transmission, nuclear security, administrative facilities, water supplies and other infrastructure already in place on that site." What is the significance of these aspects of the SCE&G proposal? The geology of the site, the presence of rail and transmission facilities, and similar aspects of the site proposed by SCE&G are not the key considerations SCE&G should address when attempting to assess the risk of cost overruns. Citing this laundry list is a red herring. While there have indeed been sites that proved disastrous, such as the site sitting on a known earthquake fault line, the kinds of factors that put the SCE&G plant budget at great risk of upward revision will exist for the proposed plants, despite the apparently positive siting factors Mr. Byrne recites. Direct Testimony of Nancy Brockway, *passim*

SCE&G acknowledges that under the design/build contract, significant elements of the cost of the plant remain subject to increases out of SCE&G's control. Only some of these cost factors are subject to indexes that could limit the extent of cost increase that can be passed through under the contract. Duke, a considerably larger and more sophisticated utility, has just doubled its cost estimate for construction of the Lee station

project, to $11 billion. If Westinghouse/Stone & Webster agreed to a contract that would not permit it to recover most of its costs in the event the budget had to double, it is unlikely that the contract would, in the end, protect SCE&G from the risk that the designer/builder would simply walk away and limit its exposure (or what might be worse, continue the project but cut corners to keep costs down).

Whatever else can be observed about the "fully developed construction plan" to which Mr. Byrne refers, it must be noted that the construction plan assumes a particular design for the AP1000. However, the design is not even set, meaning the construction plan may well have to be modified. The Nuclear Regulatory Commission, as I indicated in my Direct Testimony, has not completed its consideration of the design for the AP1000. Similarly, it is true that, as Mr. Byrne testifies, the AP1000 units are design-certified by the NRC though Revision 15. However, there are good reasons to be concerned that the changes in the design reflected in later revisions will not be approved in time to meet the construction schedule contained in the EPC Contract. Revision 16, still under review at the NRC, includes the following adjustments that must be considered, according to the Nuclear Regulatory Commission:

> a redesign of the pressurizer, a revision to the seismic analysis to allow an AP1000 reactor to be constructed on site with rock and soil conditions other than the hard rock conditions certified in the AP1000 DCR, changes to the instrumentation and control (I&C) systems, a redesign of the fuel racks, and a revision of the reactor fuel design. Another area requiring significant resources will be the review of DAC-related items, such as the technical reports on human factors engineering (HFE), the

I&C design, and piping.[1]

As of September 22, 2008, the NRC had not come close to finishing its consideration of Revision 16, when the AP1000 proponents filed Revision 17, along with numerous response to Technical Reports. Revision 17 and the Technical Report proposals add yet more issues to be resolved by the NRC. Whether or not these revisions would each be necessary in the case of the SCE&G proposal, the need for the designers to obtain NRC approval of these items must be met before SCE&G's contractors can finish designing their AP1000. Only then can they fully develop a construction schedule. The original NRC schedule called for completion of the design review by March 2010, but it is now clear that this schedule will not be met. The schedule for NRC consideration of the AP1000 design, including the recent revisions filed by proponents, is under review by the Commission. Based on press reports and reports from Westinghouse itself, it appears that China has not yet started construction of any AP1000 reactors, contrary to Mr. Byrne's claims. Rather, preparations are underway; an actual start of construction is not to begin until 2009. Mr. Byrne does not specify the design of the reactors Toshiba built in Asia. The reactors Mr. Byrne references are of a completely different design from the AP1000, such as the 1350 mWe Kashiwazaki-Kariwa Unit 6 Advanced

[1] http://www.nrc.gov/reactors/new-reactors/design-cert/amended-ap1000.html

Boiling Water Reactor built by Toshiba for Tokyo Electric Power Co. in 1996. Such construction experience is of little value in anticipating the probabilities that Westinghouse can maintain the proposed schedule for building an AP1000, which has not yet been completed anywhere in the world. While technological advances have solved some problems in the construction of large complex machines like nuclear power plants, and modular construction of standard designs may at some point mature and provide a basis for rapid plant construction on relatively solid schedules, the nuclear industry remains exposed to many of the contingencies that delayed nuclear plant construction in the 1970s and 1980s. The main problem facing the nuclear construction industry in the 1970s was the rapid change of design requirements, in turn requiring costly redesigns and retrofits for plants planned or under construction. Great efforts are underway today to achieve design standardization, on which construction efficiency and certainty could be based. Nuclear plants are among the most complicated machines constructed by man, and they have the added complication of presenting unique safety and security problems. It is not surprising that the industry has not yet achieved its goal of standardization and modular construction of a new generation of plants. The industry may sensibly wait on the beginning of construction until all the design issues are resolved and a standard design has been approved. The fact that the AP1000 design is not approved and the absence of a schedule for NRC approval make the SCE&G

contract schedule unrealistic by definition. Further, the NRC may not follow through with its present intention to combine the operating license and the design approval. Such a policy shift might speed the start of construction, but it would open the door to the erosion of the standardization objective, increasing the risk that the plants would be subject to retrofits and other budget-busting delays. But perhaps more importantly, SCE&G is too small a utility to take on the task of pioneering what may evolve into a standard design. The first attempts at construction inevitably bring to light issues that the most sophisticated design process did not anticipate. SCE&G places itself and its customers at great risk by pushing to be one of the first to build two new nuclear plants using the as-yet-unfinished AP1000 design. In the case of a project of such size and inherent uncertainty, the presence of a liquidated damages clause, in and of itself, is not enough to ensure that the designer/builder will bring the plant on line at the budgeted level. Unforeseen events could require changes in the design or construction the costs of which could easily outweigh the liquidated damages protection. For example, even before Duke has begun construction of its Lee plant, its cost estimate has recently doubled. It is hard to imagine a liquidated damages clause to which the designer/builders would agree that would be sufficient to hold them to a contract that pays them only about half of the cost of the project. Mr. Addison would have the Commission believe that can still raise capital for its nuclear construction plans despite the current economic

crisis, that the economic downturn will not affect need for the plant, and that my proposed alternatives for conditioning any approval violate the Base Load Review Act and prevent financing on reasonable terms. Mr. Addison lumps the current economic crisis with the ordinary ebbs and flows of the business cycle. He also points to the utility's recent financings as evidence that the economic crisis has not adversely affected the Company. The current economic crisis is different in scale and scope from the ordinary ebbs and flows of business activity, and a distribution utility's ability to raise limited funds to provide short-term liquidity is no gauge of whether it can obtain several billions of dollars to build two proposed nuclear power plants. The United States, and indeed, the entire world, remains in the grip of a financial and economic crisis that started earlier this year but came to a head in mid-September. In addition to distress in numerous banks and financial institution, the "real" economy is seeing large numbers of *bankruptcies or near bankruptcies. Despite an infusion of almost $700 billion into the financial sector lending to businesses exposed to the economy has become difficult to obtain and expensive. It is not clear how deep or long the downturn will be. As Mr. Addison explained in the SCANA third quarter earnings conference call with investors and analysts October 31, 2008, the Company took advantage of a "window of opportunity" and sought the additional funds from the first mortgage debt issuance and the credit line draw as defensive measures. These were not routine borrowings as Mr. Addison

suggests in his Rebuttal, but rather were intended to shore up liquidity and protect against the risk that credit markets would continue to be hard for SCE&G to access. Mr. Addison could not reassure the investment community that similar funds would continue to be available on reasonable terms through 2009. The two financings Mr. Addison discusses were not evidence of business as usual, and do not indicate that the Company will continue to have ready access to financing. Second, this docket should not turn on whether the ongoing operation of SCE&G will likely continue to kick out revenues sufficient to support repayment of the two relatively modest financings to which Mr. Addison refers. The ongoing operation of the utility is one thing, and a several billion dollar program to construct new nuclear power plants (at a cost twice the utility's rate base) is another. As recently as the end of September, Fitch ratings gave the Company a "Negative Outlook" due to "substantial financial commitment of its plan to construct two nuclear generating units for service in 2016 and 2019, respectively as well as the construction risk and uncertainties associated with a project of this size and complexity." Mr. Addison brushed aside these warnings in his Direct testimony, but the financial and economic crises if anything give them more meaning today. Even Mr. Addison recognizes (Rebuttal at p. 4, line 6) that the present financial crisis is the worst in the last 75 years. Further, other utilities have reacted with more caution and discretion to the current crisis and the prospect of continued difficulties in the economy. For example, Duke (a

much larger firm) recently announced that it is deferring for up to a year its planned filing with the South Carolina Commission for approval of the Lee nuclear power plant, to reassess forecast energy demands as well as the plant's costs Duke has already cut its annual growth projections for energy sales in the Carolinas by 28.4% over the next 16 years. If SCE&G forecast were to be reduced by the same amount, simply on account of the economic slowdown, incremental requirements for the years in which SCE&G plans to add its new AP1000 plants might be down by as much as a quarter from the present forecast. Recall that Duke in its November 3, 2008 revised IRP filing with the Commission doubled its estimated cost for construction of the two Lee nuclear plants in Gaffney to $11 billion, from the original $4 - $6 billion estimate. Duke's revised estimate is as much as $3 billion higher than its December 2007 estimate. This estimate is only for so-called "overnight" costs. Adding the carrying costs of the project over its construction period would add another $5 billion or so to the total. While some of the escalation relates to expenses not directly relevant to the SCE&G situation, other components include increases in equipment and commodity costs. The ultimate cost of new nuclear power plants cannot be estimated with certainty, but one can say with confidence that cost estimates are susceptible to sharp upward SCE&G has stated that it began looking at the nuclear option seriously when the Energy Policy Act of 2005 passed, indicating government support for new nuclear power. A key feature of

that statute is the nuclear construction loan guarantee.

Consumers cannot be held responsible for the Company's representations to the investment community regarding the meaning of the Base Load Review Act. If the Company has given Wall Street the impression that the Commission can impose no conditions on its BLRA approvals, that approvals are a foregone conclusion, and that the Company does not bear a heavy burden of demonstrating the superiority of its plan, and further if Wall Street believed such representations, what is needed is a clarification of the statute. Having said that, and referring merely to a plain language reading of the Act, one must presume the legislature used common sense in developing the Act. Given this presumption, one must assume the legislature did not intend to create a situation that either exposed consumers to unreasonable and one-sided risks, nor impeded the development of nuclear power in South Carolina. The Company's interpretation of the Act would produce one or the other of these effects. We are presently at a stage in the development of nuclear power in this country where many key design and construction issues remain to be resolved. It also happens that the Company is bringing forth its proposal for a massive nuclear plant investment at a time when economic conditions are roiling at best, and may settle into a long-term downturn, which undermines earlier projections of the need for and timing of new resources, as Duke has recognized. This is an

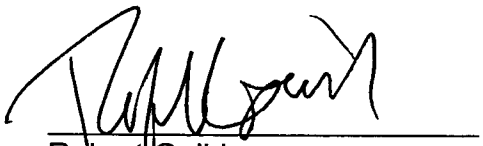
extremely risky time for any utility, much less a relatively small local utility, to bet all its resources on one option, the new nuclear path. Further, if the Company pursues this capital-intensive option, it will preclude the pursuit of more modular options that also have risks, but that would not cause irreversible harm if those risks came to pass. These modular options may need development over the years, but if they do not pan out, the Company will be able to change course without having bet twice its capitalization on them. A prudent Company would hold off on such a commitment and pursue other options more vigorously. A prudent Commission would require nothing less. The Commission is a trustee of the ratepayers' money, in effect. The Commission must ensure that the "deal" being presented does not subject the ratepayers to unreasonable risks. The Company wishes to transfer the net risks of the all-nuclear option to the consumer through its interpretation of the Act. However, the best the consumer can hope from the success of this path is reliable power at the cost of construction and operation. The upside opportunity for the consumer is limited, and consumers have no claim on the remaining assets of the Company if the bet fails. The consumer is being asked to take the downside risk, in the Company's interpretation of the Act, and thus to be in the position of a financier for the project. But the terms of the Act as the Company would have it interpreted would leave the consumer with no contractual rights to repayment of this financing, nor to sharing with the utility profits that might be achieved if the project risks do not

materialize.. To the extent the Act asks the Commission to put these extraordinary risks on the consumer without conditions to moderate the risks and share them with the utility, it raises the bar for Commission approval of these options. If the Company thinks the Act allows it to offer a pro forma justification for its proposal, and then require the Commission to transfer the risks over to the Consumer, it will not be motivated to give the same attention and care to its choice as it would were it actually betting its own money. We have seen recently what mischief occurs when firms place speculative bets with "OPM" – Other People's Money. That is what SCE&G asks the Commission to allow it to do. But, given the great risks of the all-or-nothing new nuclear path, especially at this early stage in development of new nuclear options and in light of the uncertainty of the economy, a prudent "trustee" of the consumers would reject the option altogether. Such a rejection would be without prejudice to the firm returning when the economic future is somewhat easier to predict, and when the significant issues with new nuclear power have been worked out, presumably by those with deeper pockets, and a deeper "bench" of expertise in nuclear matters. To ignore the realities of the situation, as the Company would have the Commission do, would be to turn the Base Load Review Act into a rubber stamp for any new nuclear scheme, rather than a useful tool for support of well-considered new nuclear projects. The Company's witnesses place little weight on the risks of the AP1000 nuclear option, but stress the risks of the efficiency and

renewable options. The Company puts lots of numbers in front of the Commission, but in the end, it is asking the Commission to discount all risks of the nuclear option, and reject all other possibilities. This is a particularly risky approach for consumers, because adoption of the Company's "build two nuclear plants" option will effectively prevent the Company from investing in any of the alternatives for a generation or more. However, recalibrating its load forecast and beginning a program of intensive development of more modular options would expand the Company's range of options without requiring it to turn its back on the nuclear option for a generation.

CONCLUSION

For the foregoing reasons Intervenor Friends of the Earth ("FoE") urges the Commission to deny the Combined Application of South Carolina Electric & Gas Company ("SCE&G") for a Certificate of Environmental Compatibility and Public Convenience and Necessity and for a Base Load Review Order for the Construction and Operation of a Nuclear Facility at Jenkinsville, South Carolina.



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